

AMENDMENTS IN THE CLAIMS

1. (Currently Amended) A process for the simultaneous extraction of metal anionic and cationic species [[metal ions]] from a dilute aqueous solution comprising:
 - a. contacting the aqueous solution for 0.1 to 10 minutes with an extraction solution comprising a cationic extractant selected from the group consisting of a tertiary amine having the formula R₁R₂R₃N, wherein R₁, R₂, R₃, are straight chain or branched chain hydrocarbon and may be the same or different, and R₁= C₁-C₁₈, R₂= C₁-C₁₈, R₃= C₁-C₁₈, and total C_n = 9 – 40, [[metal extractant for ions, a diluent, and a modifier at a pH below 6]] at a pH where metal ions of the cationic species are hydrolyzed, wherein the hydrolyzed metal ions coagulate into molecular or submicroscopic clusters, and/or colloids having negative charges, and the anionic species and the molecular or submicroscopic clusters, or colloids have negative charges and are extracted from the aqueous solution simultaneously with metal anionic species, and wherein the ratio of aqueous solution to extraction solution (A/E) is above about 4/1;
 - b. separating the contacted solutions into a loaded extraction solution phase containing the metal anionic and cationic species [[metal ions bound with an extractant-metal bond]] and an [[a detoxified]] aqueous phase reduced in metal anionic and cationic species [[ion]] content; and
 - c. separating the phases.

Claims 2 to 13. (Cancelled)

14. (Currently Amended) The process according to Claim 1, wherein the anionic species is HCrO₄⁻ or Cr₂O₇²⁻, and the cationic species is Cr⁺³, and wherein Cr(VI) and Cr(III) are both extracted.

15. (Currently Amended) The process according to Claim 14, wherein [[the

metal ion]] extractants comprise from about 0.5 to about 30 wt% of the extraction solution.

16. (Cancelled)

17. (Cancelled)

18. (Original) The process according to Claim 1, wherein the aqueous solution is the effluent from surface finishing operations.

Claims 19 to 21. (Cancelled)

22. (Original) The process according to Claim 1, wherein the A/E ratio is at about 4/1 to about 20/1.

23. (Original) The process according to Claim 1, wherein the A/E ratio is at about 6/1 to about 20/1.

24. (Original) The process according to Claim 1, wherein the A/E ratio is at about 8/1 to about 20/1.

25. (Cancelled)

26. (Cancelled)

27. (Currently Amended) The process according to Claim 1, wherein a mixer is used in the contacting [[and the mixer has a stirrer with a tip speed in the range of about 1.5 to about 7.5 m/sec and the residence time in the contacting ranges from about 0.1 to about 10 minutes]].

28. (Currently Amended) The process according to Claim 1, comprising a [[A]]

process for the simultaneous extraction of metal anion from an aqueous solution by means of ion pairing, and metal cation extraction by colloidal capture.

29. (Currently Amended) The process according to Claim 1, comprising a [[A]] process for the simultaneous extraction of metal anion (Cr(VI)) by ion pairing, and metal cation (Cr(III)) extraction by colloidal capture.

Claim 30. (Cancelled)

Claim 31. (Cancelled)

32. (New) The process according to Claim 1, further comprising a diluent.

33. (New) The process according to Claim 32, wherein the diluent is a high flash point aliphatic or aromatic hydrocarbon selected from the group consisting of kerosene, hexane, heptane, fuel oil, iso-octane, mineral oil, Conoco 170 Exempt Solvent (an aliphatic C12 - C15 hydrocarbon), Aromatic 150 (an high flash point aromatic hydrocarbon), Calumet 400/500, and Kurmet 470.

34. (New) The process according to Claim 32, wherein the diluent comprises an aliphatic or aromatic hydrocarbon, having about 5 to about 15 carbon atoms, and comprises from about 50 to about 99.5 wt% of the extraction solution.

35. (New) The process according to Claim 1, further comprising a modifier.

36. (New) The process according to Claim 35, wherein the modifier is selected from the group consisting of isodecanol, tri-decyl alcohol, capryl (C8) alcohol, and tri-*n*-butyl-phosphate.

37. (New) The process according to Claim 35, wherein the modifier comprises a long chain aliphatic, straight or branched chain hydrocarbon alcohol and comprises

from about 0 to about 20 wt% of the extraction solution.

38. (New) The process according to Claim 1, wherein the contacting time is 0.1 to 2 minutes.

39. (New) The process according to Claim 39, wherein the contacting time is 0.1 to 1 minute.

40. (New) The process according to Claim 1, wherein the anionic species is an oxometal ion.

41. (New) The process according to Claim 1, wherein the metal anions are selected from the group consisting of bichromate, dichromate, chromate, arsenate, arsenite, selenate, borate, and urinate; and the cations are selected from the group consisting of the cations of copper, nickel, zinc, cadmium, lead, silver, trivalent chromium, aluminum, and trivalent iron.

42. (New) The process according to Claim 1, wherein the dilute aqueous solution has less than 200 ppm of metal ions.

43. (New) The process according to Claim 1, wherein the tertiary amine comprises Alamine® 336.